

In the Claims

1 1. (Currently Amended) A method for measuring a sense node voltage associated with a
2 light-detecting element, the sense node voltage being related to light intensity incident upon the
3 light-detecting element, comprising:

4 (a) generating a first integration reset pulse to enable a resetting of the sense node
5 voltage to a voltage value substantially equal to a reset voltage value associated with the first
6 integration reset pulse, an edge of the first integration reset pulse triggering a beginning of a first
7 integration period;

8 (b) generating a second integration reset pulse to enable a resetting of the sense node
9 voltage to a voltage value substantially equal to a reset voltage value associated with the second
10 integration reset pulse, an edge of the second integration reset pulse triggering a beginning of a
11 second integration period;

12 (c) generating, subsequent to the generation of the first integration reset pulse and prior to
13 the generation of the second integration reset pulse, a plurality of intra-period reset pulses to
14 enable resetting of the sense node voltage to a plurality of voltage values, each voltage value
15 being substantially equal to a reset voltage value associated with the generated intra-period reset
16 pulse, the intra-period reset pulses progressively decreasing in pulse width; and

17 (d) measuring, only once during an integration period, the sense node voltage generated
18 in response to incident light intensity, the sense node voltage being measured subsequent to the
19 generation of the plurality of intra-period reset pulses and prior to the generation of the second
20 integration reset pulse.

1 2. (Original) The method as claimed in claim 1, wherein the reset voltage values
2 associated with the plurality of intra-period reset pulses are less than the reset voltage value
3 associated with the first integration reset pulse.

1 3. (Original) The method as claimed in claim 2, wherein the reset voltage value
2 associated with one of the plurality of intra-period reset pulses is less than the reset voltage value
3 associated with a previous one of the plurality of intra-period reset pulses.

1 4. (Original) The method as claimed in claim 1, wherein the generation of the plurality of
2 intra-period reset pulses is non-periodic.

1 5. (Original) The method as claimed in claim 2, wherein the generation of the plurality of
2 intra-period reset pulses is non-periodic.

1 6. (Original) The method as claimed in claim 3, wherein the generation of the plurality of
2 intra-period reset pulses is non-periodic.

1 7. (Original) The method as claimed in claim 1, wherein the generation of the plurality of
2 intra-period reset pulses is periodic.

1 8. (Original) The method as claimed in claim 2, wherein the generation of the plurality of
2 intra-period reset pulses is periodic.

1 9. (Original) The method as claimed in claim 3, wherein the generation of the plurality of
2 intra-period reset pulses is periodic.

1 10. (Original) The method as claimed in claim 1, further comprising:
2 (e) resetting a voltage level of the sense node when the voltage level of the sense node is
3 less than the voltage value associated with the generated intra-period reset pulse.

1 11. (Currently Amended) A method for measuring a sense node voltage associated with a
2 light detecting element, the sense node voltage being related to light intensity incident upon the
3 light detecting element, comprising:

4 (a) initiating an integration period for the light-detecting element;

5 (b) resetting, using a plurality of intra-period reset pulses, a plurality of times, the voltage

6 level of the sense node after initiating the integration period, the intra-period reset pulses
7 progressively decreasing in pulse width; and

8 (c) measuring, only once during the integration period, the sense node voltage generated

9 in response to incident light intensity, the sense node voltage being measured subsequent to the

10 plural resettings of the voltage level of the sense node and prior to initiating a next integration

11 period.

1 12. (Original) The method as claimed in claim 11, wherein the voltage levels associated

2 with the plural resettings of the voltage level of the sense node have voltage values less than a

3 voltage value used to reset the voltage level of the sense node at a beginning of the integration

4 period.

1 13. (Original) The method as claimed in claim 11, wherein a voltage level associated with

2 one of the plural resettings during the integration period is less than a voltage level associated

3 with a previous one of the plural resettings during the integration period.

1 14. (Original) The method as claimed in claim 11, wherein the plural resettings generate a

2 non-periodic pattern.

1 15. (Original) The method as claimed in claim 11, wherein the plural resettings generate a

2 periodic pattern.

1 16. (Currently Amended) A method for capturing a frame of image data associated with a

2 scene using an array of light-detecting elements, each light-detecting element having an

3 associated sense node, comprising:

4 (a) initiating an integration period for the array of light-detecting elements, the

5 integration period being associated with the frame of image data;

6 (b) generating a plurality of intra-period reset pulses during the integration period such
7 that voltage levels of the sense nodes associated with a portion of the array of light-detecting
8 elements are enabled to be set a plurality of times during the integration period, the intra-period
9 reset pulses progressively decreasing in pulse width; and

10 (c) measuring, only once during the integration period, the voltage levels of the sense
11 nodes voltages generated in response to incident light intensities, the sense node voltages being
12 measured subsequent to a final resetting of the voltage levels of the sense nodes associated with
13 the portion of the array of light-detecting elements and prior to initiating a next integration
14 period.

1 17. (Original) The method as claimed in claim 16, wherein the voltage levels associated
2 with the plurality of intra-period reset pulses have voltage values less than a voltage value used
3 to reset the voltage levels of all the sense nodes at a beginning of the integration period.

1 18. (Original) The method as claimed in claim 16, wherein a voltage level associated with
2 the plurality of intra-period reset pulses during the integration period is less than a voltage level
3 associated with a previous one of the plurality of reset pulses during the integration period.

1 19. (Original) The method as claimed in claim 16, wherein the voltages levels associated
2 with the plurality of intra-period reset pulses during the integration period progressively decrease
3 during the integration period.

1 20. (Original) The method as claimed in claim 16, further comprising:
2 (d) resetting a voltage level of the sense node when the voltage level of the sense node is
3 less than the voltage value associated with the generated reset pulse.

1 21. (Currently Amended) A method for measuring a sense node voltage associated with a
2 light detecting element, the sense node voltage being related to light intensity incident upon the
3 light detecting element, comprising:

4 (a) initiating an integration period for the light-detecting element;

5 (b) resetting, a first number of times during the integration period, using a number of
6 intra-period reset pulses, the number of intra-period reset pulses being equal to the first number
7 of times, the voltage level of the sense node after initiating the integration period, the intra-
8 period reset pulses progressively decreasing in pulse width; and

9 (c) measuring the sense node voltage generated in response to incident light intensity, the
10 sense node voltage being measured a second number of times during the integration period, the
11 second number of times being less than the first number of times.

1 22. (Original) The method as claimed in claim 21, wherein the voltage level associated
2 with resetting of the voltage level of the sense node has a voltage value less than a voltage value
3 used to reset the voltage level of the sense node at a beginning of the integration period.

1 23. (Original) The method as claimed in claim 21, wherein the first number of times is
2 greater than one and wherein a voltage level associated with one of the plural resettings during
3 the integration period is less than a voltage level associated with a previous one of the plural
4 resettings during the integration period.

1 24. (Currently Amended) A method for measuring a sense node voltage associated with a
2 light-detecting element, the sense node voltage being related to light intensity incident upon the
3 light-detecting element, the light-detecting element having a reset switch associated therewith so
4 as to set a voltage level of the sense node, comprising:

5 (a) generating a first integration reset pulse to enable a resetting of the sense node
6 voltage to a voltage value substantially equal to a reset voltage value associated with the first
7 integration reset pulse, an edge of the first integration reset pulse triggering a beginning of a first
8 integration period;

9 (b) generating a second integration reset pulse to enable a resetting of the sense node
10 voltage to a voltage value substantially equal to a reset voltage value associated with the second

11 integration reset pulse, an edge of the second integration reset pulse triggering a beginning of a
12 second integration period;

13 (c) generating, subsequent to the generation of the first integration reset pulse and prior to
14 the generation of the second integration reset pulse, a train of progressively decreasing intra-
15 period reset pulses to enable resetting of the sense node voltage to a plurality of voltage values,
16 each voltage value being substantially equal to a reset voltage value associated with the
17 generated intra-period reset pulse; and

18 (d) measuring, only once during an integration period, the sense node voltage generated
19 in response to incident light intensity, the sense node voltage being measured subsequent to the
20 generation of the train of progressively decreasing intra-period reset pulses and prior to the
21 generation of the second integration reset pulse, the train of progressively decreasing intra-period
22 reset pulses progressively decreasing in pulse width.

1 **Claim 25 (Cancelled)**

1 26. (Original) The method as claimed in claim 24, wherein the train of progressively
2 decreasing intra-period reset pulses progressively decreases in voltage level.

1 **Claim 27 (Cancelled)**

1 28. (Original) The method as claimed in claim 24, wherein the train of progressively
2 decreasing intra-period reset pulses represents a non-periodic pattern.

1 29. (Original) The method as claimed in claim 24, wherein the train of progressively
2 decreasing intra-period reset pulses represents a periodic pattern.

1 30. (Currently Amended) The method as claimed in claim 24, further comprising:

2 (e) resetting a voltage level of the sense node when the voltage level of the ~~of the~~ sense
3 node is less than the voltage value associated with the generated intra-period reset pulse.

1 31. (Currently Amended) A method for measuring a sense node voltage associated with a
2 light-detecting element, the sense node voltage being related to light intensity incident upon the
3 light-detecting element, comprising:

4 (a) generating a first integration reset pulse to enable a resetting of the sense node
5 voltage to a voltage value substantially equal to a reset voltage value associated with the first
6 integration reset pulse, an edge of the first integration reset pulse triggering a beginning of a first
7 integration period;

8 (b) generating a second integration reset pulse to enable a resetting of the sense node
9 voltage to a voltage value substantially equal to a reset voltage value associated with the second
10 integration reset pulse, an edge of the second integration reset pulse triggering a beginning of a
11 second integration period;

12 (c) generating, subsequent to the generation of the first integration reset pulse and prior to
13 the generation of the second integration reset pulse, a plurality of intra-period reset pulses to
14 selectively reset the sense node voltage to a plurality of voltage values, each voltage value being
15 substantially equal to a reset voltage value associated with the generated intra-period reset pulse,
16 the intra-period reset pulses progressively decreasing in pulse width; and

17 (d) measuring, only once during an integration period, the sense node voltage generated
18 in response to incident light intensity, the sense node voltage being measured subsequent to the
19 generation of the plurality of intra-period reset pulses and prior to the generation of the second
20 integration reset pulse.

1 32. (Original) The method as claimed in claim 31, wherein the reset voltage values
2 associated with the plurality of intra-period reset pulses are less than the reset voltage value
3 associated with the first integration reset pulse.

1 33. (Original) The method as claimed in claim 32, wherein the reset voltage value
2 associated with one of the plurality of intra-period reset pulses is less than the reset voltage value
3 associated with a previous one of the plurality of intra-period reset pulses.

1 34. (Original) The method as claimed in claim 31, wherein the generation of the plurality
2 of intra-period reset pulses is non-periodic.

1 35. (Original) The method as claimed in claim 32, wherein the generation of the plurality
2 of intra-period reset pulses is non-periodic.

1 36. (Original) The method as claimed in claim 33, wherein the generation of the plurality
2 of intra-period reset pulses is non-periodic.

1 37. (Original) The method as claimed in claim 31, wherein the generation of the plurality
2 of intra-period reset pulses is periodic.

1 38. (Original) The method as claimed in claim 32, wherein the generation of the plurality
2 of intra-period reset pulses is periodic.

1 39. (Original) The method as claimed in claim 33, wherein the generation of the plurality
2 of intra-period reset pulses is periodic.

1 40. (Original) The method as claimed in claim 31, wherein the voltage level of the sense
2 node is reset when the voltage level of the sense node is less than the voltage value associated
3 with the generated intra-period reset pulse.